



Gendered assessment of livestock feeding systems in northern and southern Burkina Faso



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PROGRAM ON
Livestock

Gendered assessment of livestock feeding systems in northern and southern Burkina Faso

Tunde Amole, Augustine Ayantunde and Alan Duncan

International Livestock Research Institute

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Acknowledgement

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Summary

The possibility for improving livestock production through feed development was assessed using the Gendered Feed Assessment Tool (G-FEAST) in two agroecological zones: Sahelian North and humid South Sudan regions of Burkina Faso. Results from gendered focus group discussions and individual interviews indicated that mixed crop-livestock production systems are dominant in the study sites. The town of Samorangouan in the south is dominated by cereals (maize, sorghum and millet), legumes (groundnut and cowpea), and cotton as a major cash crop. Moving northwards to Falagountou, millet, groundnut and cowpea are the principal crops. The results show that in Falagountou, male farmers derive more income from livestock production than women, although women are involved in feeding and taking care of the animals. Livestock being a major source of household income, decision-making and control is within the male domain. Contrary to this observation, women in Samorangouan derive disproportionately more income from livestock (50%) using overall household income as a comparator. There are variations in the ranking of livestock problems among male and female farmers. In both sites, female farmers ranked shortage of water as the major problem facing livestock while male farmers ranked inadequate feed as the major problem. The results show that livestock contribute significantly to rural income in both Falagountou and Samorangouan and are likely to be a promising pathway out of poverty for most households. Since the major livestock limitation is lack of quality feed (according to the men) and water (according to the women), target interventions should include combinations of feed and water solutions.

Introduction

Nutritious feeding of animals is essential for improved productivity of livestock in the Sahel and elsewhere. Livestock play multiple roles in household livelihoods in West African agricultural land use systems (risk avoidance, manure provision, wealth saving, food provision, traction, etc.) (Powell et al. 2004). Ruminant nutrition in this region depends largely on naturally growing pastures as the main feed resources which fluctuate both quantitatively and qualitatively with the season. Besides natural pastures, many livestock farmers in the region depend on crop residues, which are important feed resources during the dry season. Associated with the seasonal fluctuation in quantity and quality of feed resources is poor nutrition of animals, which is a major constraint to livestock production in the West African Sahel (Fernández-Rivera et al. 2005). Hence, the cyclic curve of weight gain in the wet season and weight loss in the dry season is a common feature of livestock production in the Sahel.

In developing good and sustainable technological interventions to address the problem of feed shortage, it is necessary to assess existing and potential feed resources, use, costs and gaps with respect to ruminant production to meet the requirements of livestock. These evaluations will guide the development of effective strategies to improve nutrition and livestock productivity based on locally available feed resources. Decision support tools have the potential to play an important role. For example, the Feed Assessment Tool (FEAST)¹ is an example of a decision support tool that presents an evolving methodology for conducting rapid appraisals of livestock feed issues in smallholder livestock systems. FEAST is a systematic method for assessing local feed resource availability and use with a view to optimize feed utilization and animal production.

Previous reports have reported on feed resources and intervention strategies in various parts of West Africa (Amole and Ayantunde 2016; Umutoni et al. 2015). Uptake of agricultural technology and livestock feeding interventions are strongly affected by gender relations and this is a neglected area in assessing feed resources and proposing intervention strategies. Gender is important since women and men farmers in a community face different constraints related to livestock feeding. Women play major roles in livestock production in the care of animals, grazing, fodder collection, processing milk and sales. Despite their considerable involvement and contribution, the challenges of women in livestock production and targeted intervention are masked in most studies since gender disaggregated data is usually not collected and gender issues are not directly considered. The aim of this study using G-FEAST was to provide in-depth information on intra-household dynamics and decision-making processes that could have important implications for women with regards to livestock feeding issues. The hope is that this will inform livestock feed intervention strategies which lead to more equitable gender outcomes.

¹ www.ilri.org/feast

Methodology

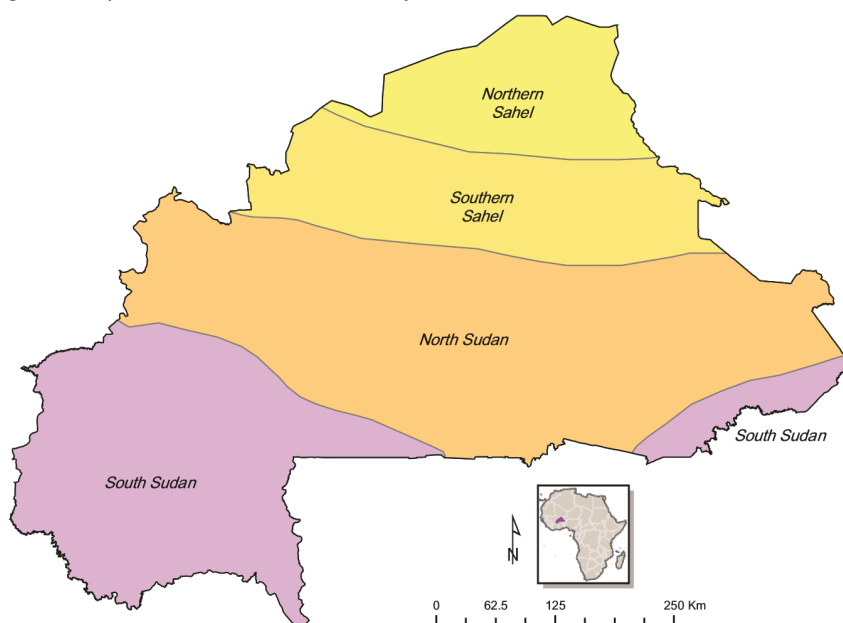
Site description

Burkina Faso is a Sahelian warm tropical country with three broad climatic zones. The dry Sahelian north, the North Sudan zone and the more humid South Sudan region. The Sahelian north has mean annual rainfall of 300–600 mm and a dry season of 7–9 months (October–June). The North Sudan zone in central Burkina Faso has mean annual rainfall of 600–900 mm, with a 4–5 months rainy season (June–October). The South Sudan region in the south has mean annual rainfall of 900–1200 mm and a rainy season lasting 6–7 months (May–October) (Beal et al. 2015).

Falagountou is a town located in Yatenga province between the Sudano-Sahelian and the Sahelian climate zones. Falagountou lies within 14°21'41.9"N 0°10'59.5"E (<https://goo.gl/maps/MtRvvpJWSYx36VGCA>) The climate is characterized by an extended dry season from November–May. The average annual rainfall in the province for the period 1963–2003 was reported as 617 mm, with the ranges from 358 mm in the North of the province to 836 mm in the South (Douxchamps et al. 2015). Livestock production is extensive involving cattle, sheep, goats and poultry, although there are households that practice sedentary livestock production systems which often involve lactating cows and animal fattening. Under this sedentary system, animals are confined and are stall fed.

Samorangouan is a town in Houet province in the west of Burkina Faso within 11°23'32.9"N 4°56'16.2"W (<https://goo.gl/maps/RMPmrk2PSIF9sICQ7>) the South Sudanian climatic zone, with an average rainfall of 1200 mm per year (Guinko 1984). This agricultural zone is characterized by perennial cultivation (mangoes, citrus fruits, common cashew, etc.) cotton, yam and cereals (sorghum, millet and maize). It is also a reception zone for transhumance livestock during the dry season and violent conflicts between agriculturalists and pastoralists are common.

Figure 1: Map of Burkina Faso and the study sites



Survey sampling

The surveys were conducted between June and July 2019 using the Feed Assessment Tool (FEAST) (Duncan et al. 2012). In this study, we used the gendered version of the FEAST tool (G-FEAST) (Lukuyu et al. 2019). The gendered FEAST adds value to the existing FEAST by identifying which aspects of gender relations in households affect animal feeding practices and the uptake of feeding interventions. The approach also identifies differences in opportunities and constraints in animal feeding between different household types. FEAST consists of a focus group discussion (FGD) and an individual household survey. For the FGDs in this study, men and women farmers formed separate groups, while for the individual questionnaire both male and female respondents were interviewed using standard FEAST questions. Respondents were also asked specific gender-related questions outlined in G-FEAST.

In Falagountou, 12 male and 12 female farmers were involved in focus group discussions (FGD) to assess the constraints and opportunities for improving livestock feeding systems, participatory diagnosis of livestock production systems and availability of feed resources. In Samorangouan, the male FGD involved 12 farmers and the female FGD involve 17 farmers. Based on the FGDs, the average land holding was determined in each community and this was used to categorize the farmers into three wealth groups. Three farmers from each of the three wealth categories undertook the household questionnaire in each community. A semi-structured questionnaire was used to gather specific gender-disaggregated information from farmers on feed resources and feeding practices, household income, decision-making on livestock production and income from livestock and its products. A total of 36 farmers (9 male and 9 females in each village) were interviewed. Samples of available feed resources offered to animals were collected and analyzed for nitrogen and ash content, fibre components (NDF, ADF and ADL) and in vitro organic matter digestibility using the Near Infra-red Spectroscopy (NIRS).

Data analysis

The quantitative data collected from individual key informant farmers were entered into the FEAST application (www.ilri.org/feast) to generate standard graphical outputs.

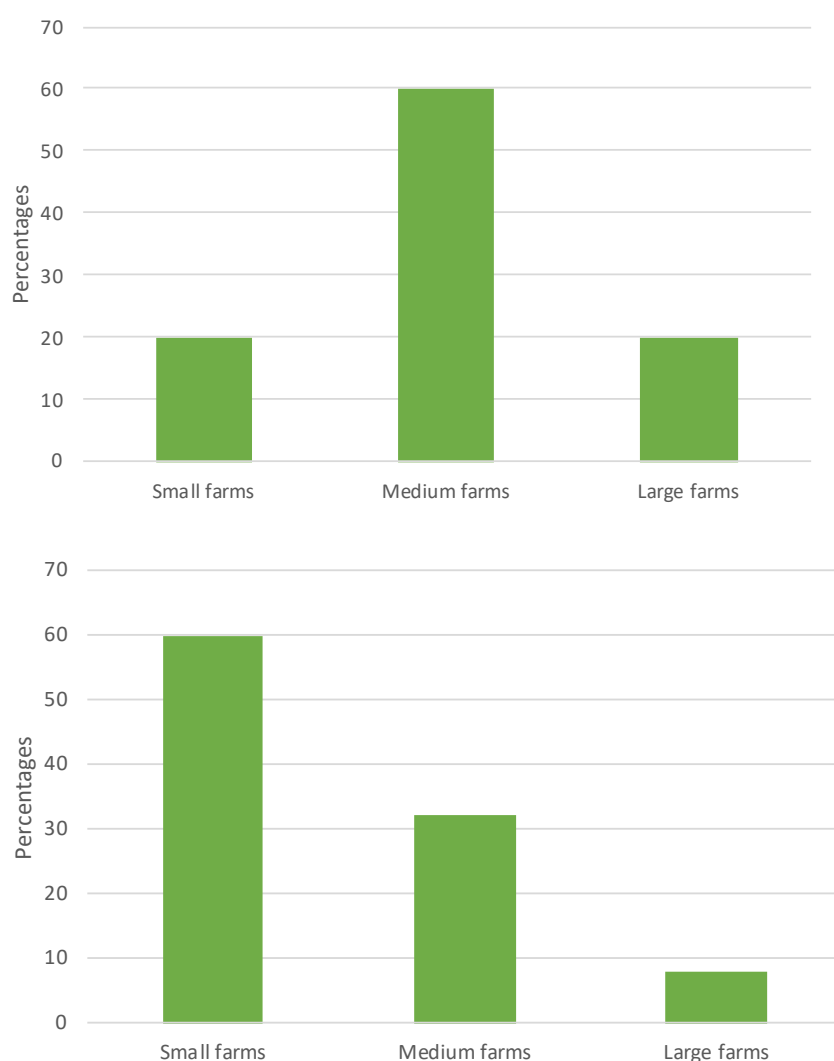
Results and discussion

Overview of the farming system

Households by landholding category and ownership

The results of the survey showed that households by landholding can be categorized into small, medium and large farms in Falagountou and Samorangouan (Figure 2). Farmers in Falagountou ranked medium farms (60%) as the most prominent category, while in Samorangouan small scale farmers were ranked as most prominent.

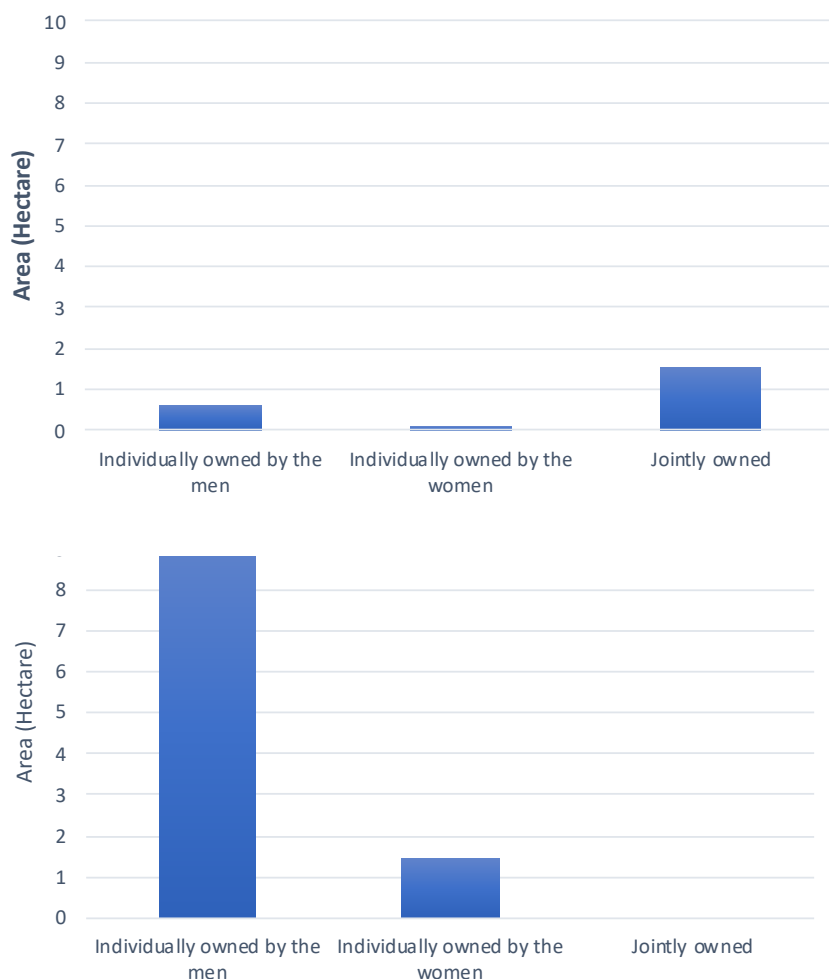
Figure 2: Households by landholding categories in (a) Falagountou and (b) Samorangouan



Land ownership

Data on land ownership shows considerable variation across sites. As we understood from the interview, land in Falagountou is owned individually by men and women, as well as jointly owned. In Samorangouan, land is mostly individually owned by men or women; joint ownership is rare. In Falagountou, land is mostly jointly owned while in Samorogouan male ownership dominates (Figure 3).

Figure 3: Land ownership by gender in (a) Falagountou and (b) in Samorogouan

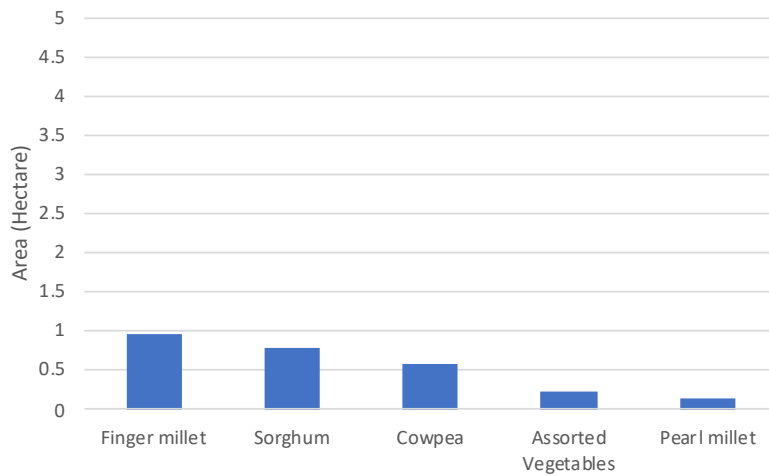


Crop production systems

The major crops grown in Falagountou are millet (finger and pearl), sorghum, maize and cowpea which are planted during the rainy season, and vegetables and eggplant which are planted in the dry season (Figure 4). Finger millet is the dominant crop (up to one hectare) while cowpea is dominant among the leguminous crops. The major crops grown in Samorangouan are cotton, maize, sorghum, finger millet, groundnut, cowpea and vegetables which are planted mostly for household consumption (Figure 4). Cropping patterns are similar among men and women in Falagountou although female-headed households cultivate less land (0.1 hectare) than male-headed household (Figure 5). On the contrary, female-headed household do not cultivate land in Samorangouan.

Figure 4: Average area cultivated per household by crop type for male (a) and female (b) farmers in Falagountou and Samorangouan

(a)



(b)

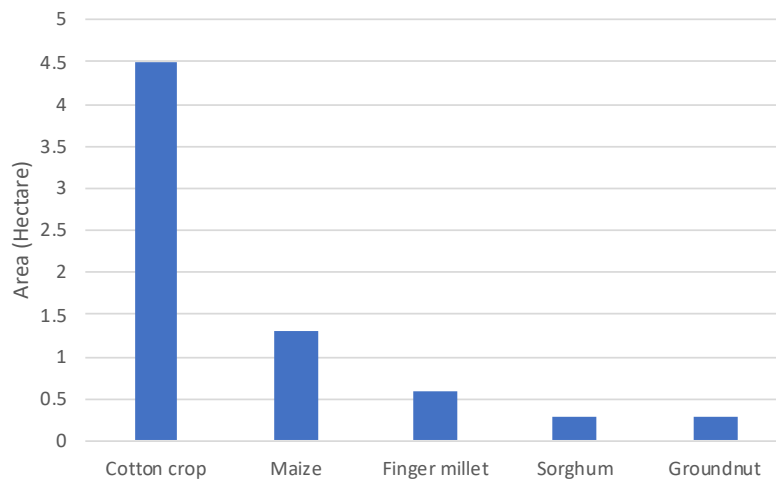
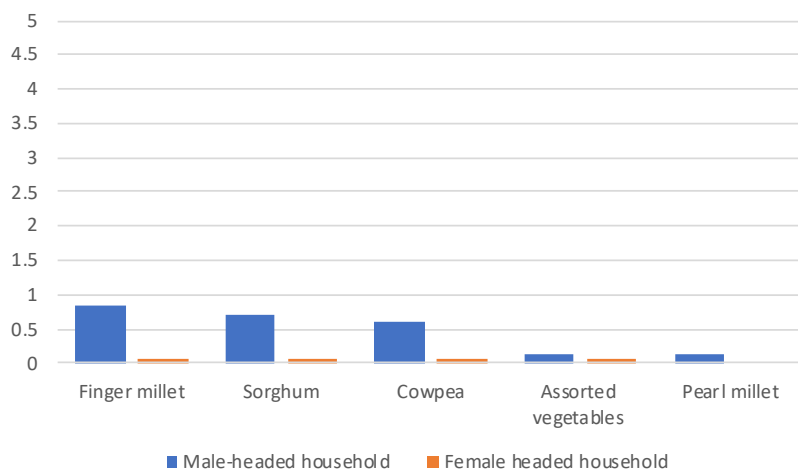
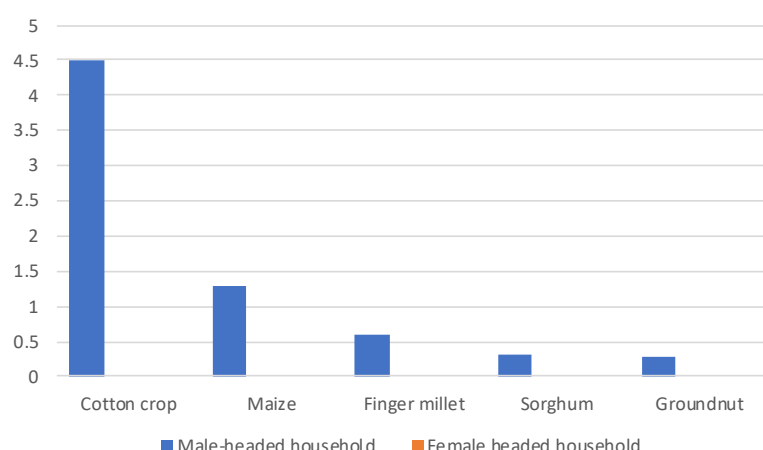


Figure 5: Dominant crop type cultivated by gender of household head in (a) Falagountou and (b) Samorangouan

(a)



(b)



Water sources and irrigation systems

Responses from the focus group discussion revealed that water sources in Falagountou were wells drilled with mechanical pump and shallow wells which are located 2 km–4 km away from the village. Year-round unavailability of water from these sources constitutes a major constraint to both crop and livestock production. With regards to livestock, only 20% of the household have access to water for their livestock from the water source. Many animals trek long distances in search of water sources about 7 km away from the site. According to farmers, only 35% of the households have access to irrigation making it difficult to practice irrigated farming. This limits the productive capacity of farmers in the dry season. In Samoranguan, major sources of water were dug wells, bore holes, shallow wells and ponds. According to both male and female respondents, water for livestock is available for every household. Despite the several sources of water in the area, only 15% of households engage in irrigation. The methods of irrigation are manual with the use of buckets and mechanical using motor pumps.

Labour and migration

In Falagountou, farmers use both family and hired labor for most farming activities. According to both male and female farmers, hired labour is readily available in the area in all seasons. The average cost of labour varies between CFA2000 and CFA3000 per day (USD3 and 5)². According to the farmers, an average of 16% of people in every household migrate for better employment and trading. Of the migrants, 10% are women and 5% are youth while the rest were reported to be men. According to respondents in Samonrangouan, labour is needed for all cropping activities including ploughing, planting and weeding at an average cost of CFA2500 per, especially during the off season. Labour is also required during the wet season for similar activities and costs CFA2300 per day. According to the farmers, an average of 10% of tpeople in every household migrate for educational purposes, better employment and trading. More than 50% of the migrants are youth. Some migrate to Cote d'Ivoire to work as laborers on plantations while others migrate through marriage.

Credit facilities and farm input services

Credit services by the government micro finance institute (Cassie populaire) is available in Falagountou. Both male and female respondents confirmed that due to several factors, only 20% of the farmers have accessed the service. Within this limited number, 80% are male while only 20% are female. This shows that the problem of inaccessibility of credit mostly affects women. However, savings and loans associations, where members make contributions to the pool and can also borrow, have been a successful practice for credit facilities among women. All the farmers confirmed that financial credit is mostly required for the fattening enterprise. Similarly, credit services are provided by the government micro finance

² 1 CFA is approximately 0.0017 USD.

institute in Samorangouan. The most limiting factor in accessing formal credit is the demand for high collateral and a guarantor. Both male and female respondents confirmed that male farmers have more access to credit facilities than female farmers. Farmer cooperative credit and loan groups that provide informal credit services also exist in the community.

According to respondents in Falagountou, inputs such as fertilizers, improved seeds and tractor services by both government and private providers are readily available but the cost of these services are generally high. According to the male and female focus groups in Samorangouan, besides the inputs mentioned above, livestock feed, veterinary inputs and irrigation materials are readily available at the local market near the community.

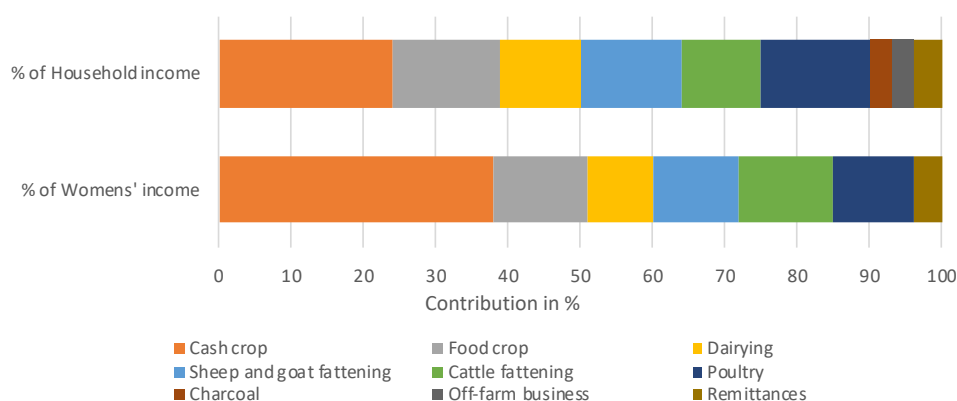
Sources of household income and decision-making on income

Relative contribution of major sources of income

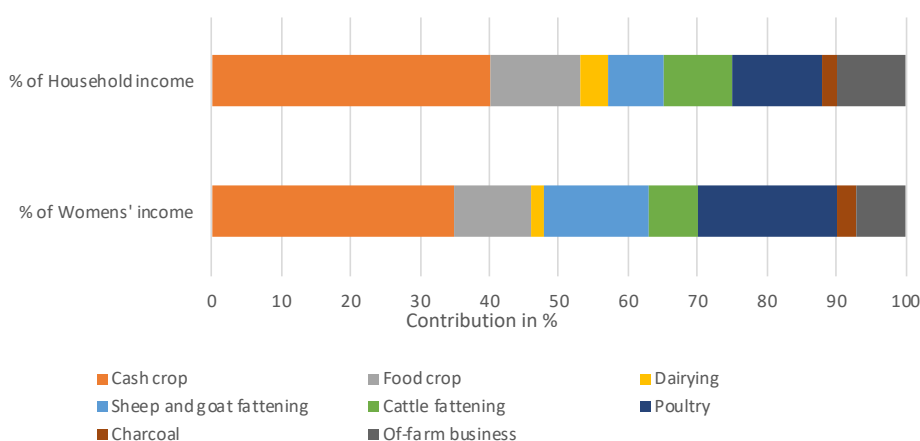
In Falagountou, the largest contribution (54 %) of household income is the cumulative income from all livestock related activities (dairying, fattening and poultry). The major source of women's income in Falagountou is from crop farming as an aggregate of cash (38%) and food crops (11%) (Figure 6). Sheep and goat fattening and poultry rearing contribute more to overall household income than their contribution specifically to women's income. Other off-farm businesses contribute to household income but not to women's income particularly. In contrast to the results from Falagountou, the major source of household income in Samorangouan is crop farming (cash and food crops). The contribution from all livestock and livestock products is lower than the contribution from cash crops alone in Samorangouan (Figure 6). Generally, livestock contribute more to women's income than to the household income in Samorangouan. The survey showed that women in Samorangouan engage in other off-farm activities such as charcoal making, which contributes to 10% of their income (Figure 6).

Figure 6: Relative contribution of major sources of income to household and women's income in (a) Falagountou and (b) Samorangouan

(a)



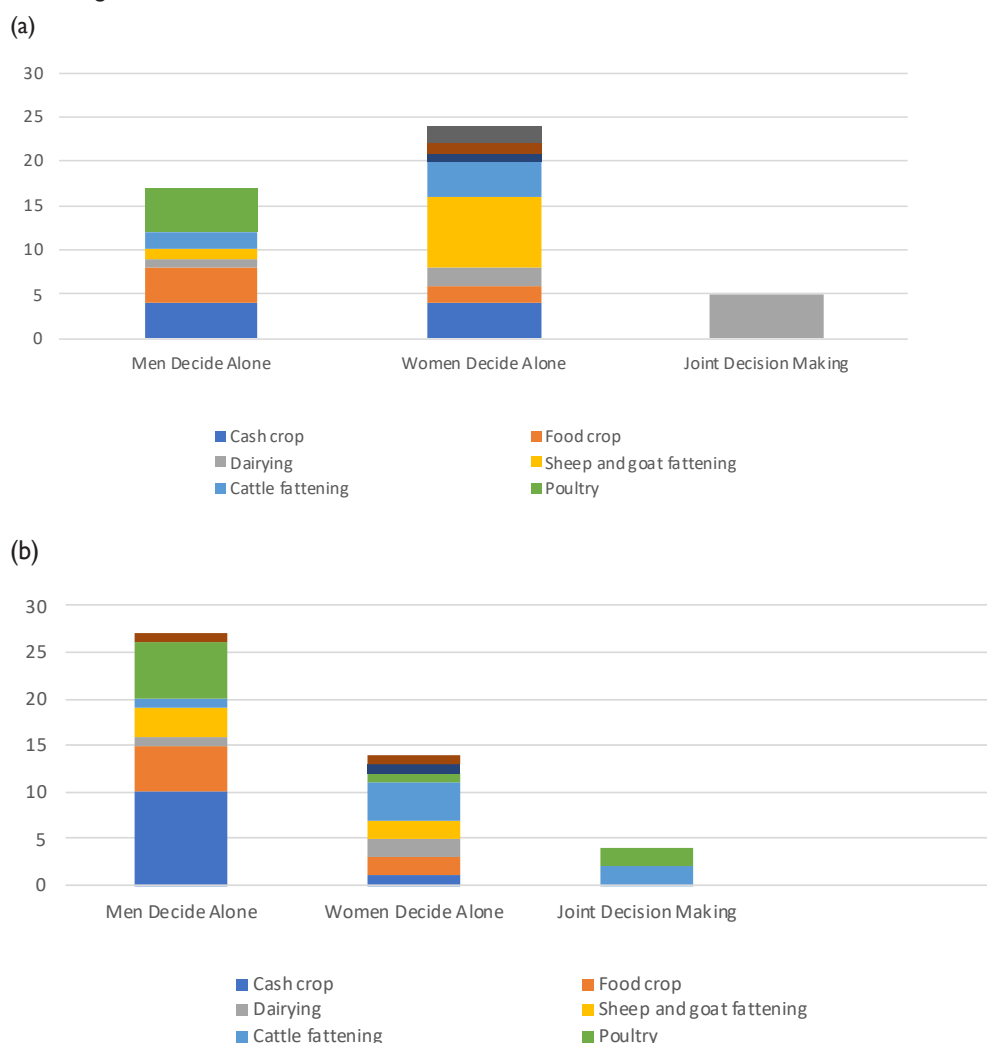
b)



Gendered decision-making on major sources of household income

We recorded that major household income in Falagountou comes from crop and livestock as well as non-agricultural sources. However, the results revealed that decisions on income from sheep and goat fattening are mostly made by women while utilization of the proceeds from the sales of milk is jointly made. The result also showed that the decision on income from poultry is mostly done by men (Figure 7). Similarly, decisions on the proceeds from cash crops, food crops and poultry meat are predominantly made by men in Samorangouan (Figure 7). The results showed that women took the lead in deciding on income from fattening of cattle, sheep and goats.

Figure 7: Gendered decision-making on major sources of household income by male and female farmers in (a) Falagountou and (b) Samorangouan



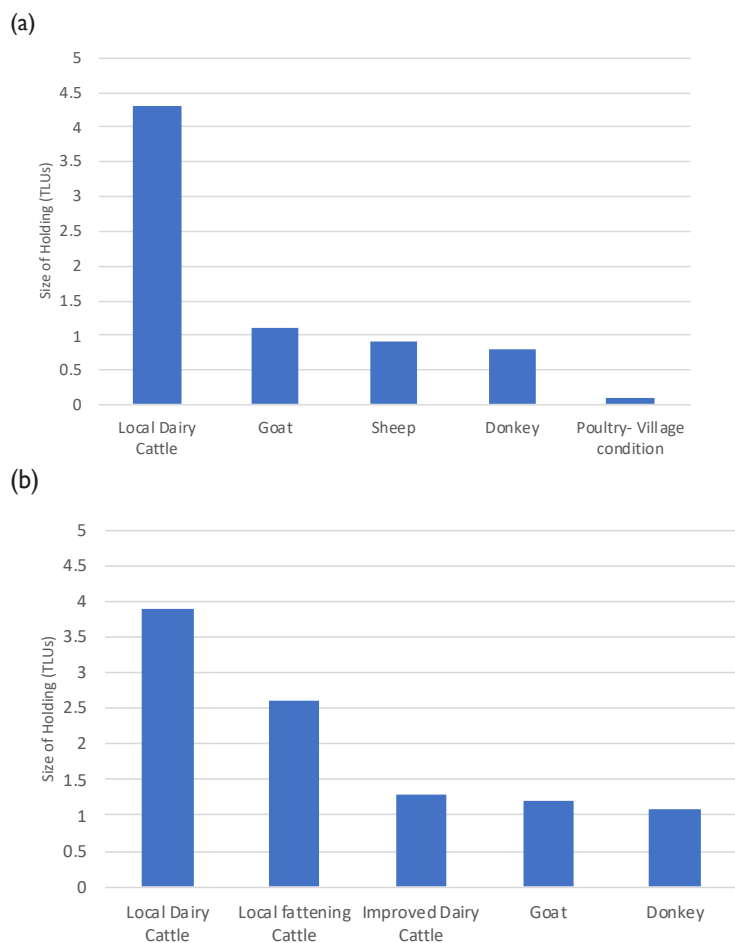
Livestock production systems (livestock assets, roles and management)

Livestock form an integral part of agriculture and almost every farming household keeps ruminants and/or indigenous chicken. Different livestock species are kept for various purposes. Livestock species in Falagountou include local breeds of cattle, sheep, goat, poultry and donkey with no improved breeds. As a matter of importance, 60% of the households keep local dairy cattle for milk production both for household consumption and for income (Figure 8). 30% of households fatten goats and 20% keep sheep. At least one draught ox is kept in the household for farm work.

In Samorangouan, livestock species include local cattle (dairy and fattening), improved dairy cattle, sheep, goat, pig, poultry and donkey. Every household in Samorangouan rears at least 10 local chickens which are sold as the need arises and also slaughtered for consumption during festivals or ceremonies, and occasionally for food. According to the farmers, about

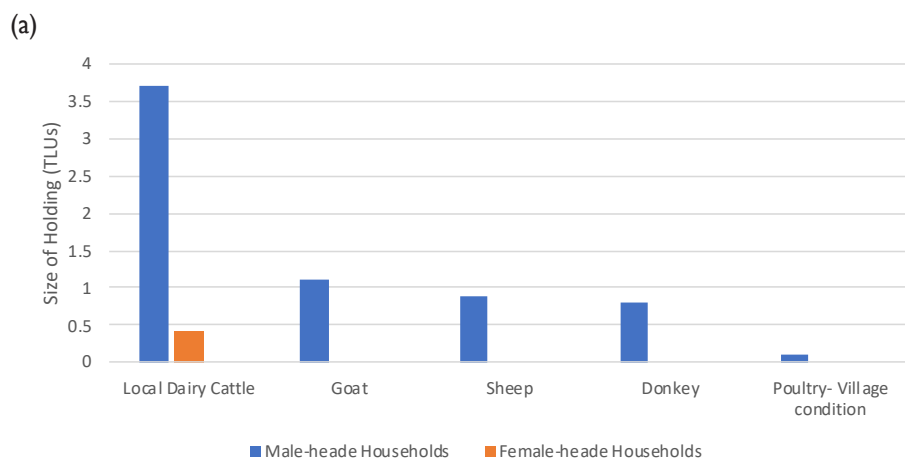
70% of households have goats with an average number of five per household. There are few improved breeds of livestock in Samoranguan. According to the farmers, these are crosses of exotic breeds and local breeds.

Figure 8. Dominant livestock category in tropical livestock units (TLU) in (a) Falagountou and (b) Samoranguan

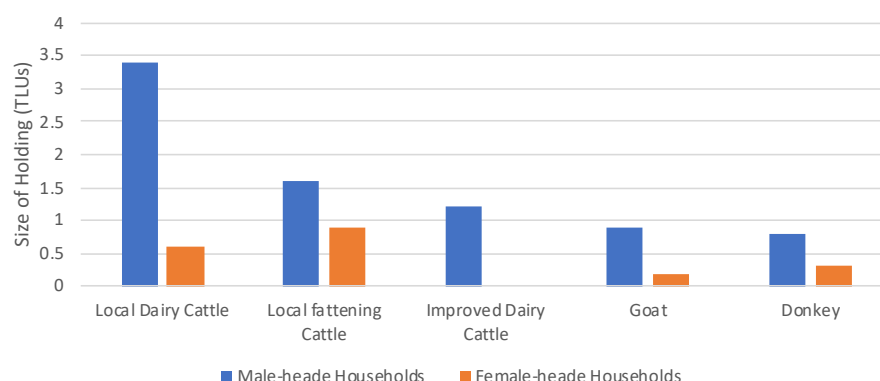


The results on dominant species by household head type showed that male-headed households had more livestock than female-headed household in Falagountou (Figure 9). Local dairy cattle are dominant among all female-headed households. Similarly, in Samoranguan, livestock are mostly kept by men. It was observed that female-headed household in Samoranguan were engaged in livestock production more than those in Falagountou (Figure 9).

Figure 9. Dominant livestock category in tropical livestock units (TLU) by gender household heads in (a) Falagountou and (b) Samoranguan



(b)



Management of livestock

Livestock management systems generally practiced in Falagountou were both extensive and intensive system. Animals are kept on grazing for most of the year. However, during the rainy season, farmers reported that all animals are kept at home in the sheds. This was done to keep the animals from destroying the planted crops. At this time, animals are fed harvested natural pastures and crop residues which were either purchased or from the farm. Fattened animals are kept in the shed and provided with feed and water. Feeds are supplied directly without any form of processing. A few farmers practice feed mixing without any specific mix ratio.

Animals are kept in an enclosure with a mini fence in Samorangouan. This serves as confinement or housing overnight. However, lactating and sick animals are separately housed. According to the farmers, 80% of households provide wooden feeding troughs for animals. Farmers reported that fattened bulls are kept within the animal enclosure and are stall fed, although occasional grazing is allowed. Sheep and goats are permanently on grazing. From the respondents, 40% of the households process the feed before serving the animals. The processing entails chopping of crop residues and feed ration mixing using maize bran and locust bean powder (*Parkia biglobossa*).

Animal health and AI

Fever and diarrhea are the major livestock diseases mentioned in Falagountou although the precise nature of the disease was unclear. Farmers reported that government veterinary services are located 20 km away from the village and are available at the cost CFA2000 for a major treatment per animal and are accessible to both male and female farmers. Farmers said that artificial insemination (AI) services were not available in the study sites.

Skin disease (lesions), foot and mouth disease and respiratory diseases were reported to be the major livestock diseases in Samorangouan. The respondents also mentioned incidence of trypanosomiasis. All the farmers confirmed the use of traditional veterinary medicine sourced from tree leaves and twigs. When the traditional remedies fail farmers resort to veterinarians which charged up to CFA1500 for treatment per animal. The AI service was introduced to Samorangouan during a funded project (by unnamed agency and the government of Burkina Faso) and the cost of two inseminations was CFA35000. After the project ended, private service providers are still available at same cost.

Feeds and feeding issues

Rainfall and feed availability

Results of the survey from both sites showed that the predominant livestock feeds are cereal and legume crop residues, concentrates and green forage in natural pastures. The available feedstuff varies depending on rainfall pattern throughout the year and at the different study sites (Figure 10). During the rainy season in Falagountou (July–December), animals

depend largely on green forage in natural pastures. Similarly, in Samorangouan, green forage from natural pastures is the major feed resource during the rainy season (July–September) (Figure 10). Crop residues are the main feed resources in the dry season in Falagountou starting in November until harvest time in June, and from October to harvest time in June in Samorangouan. Legume crop residues are more commonly used in Samorangouan than in Falagountou (Figure 10).

Figure 10: Rainfall and feed availability from farmers in (a) Falagountou and (b) Samorangouan



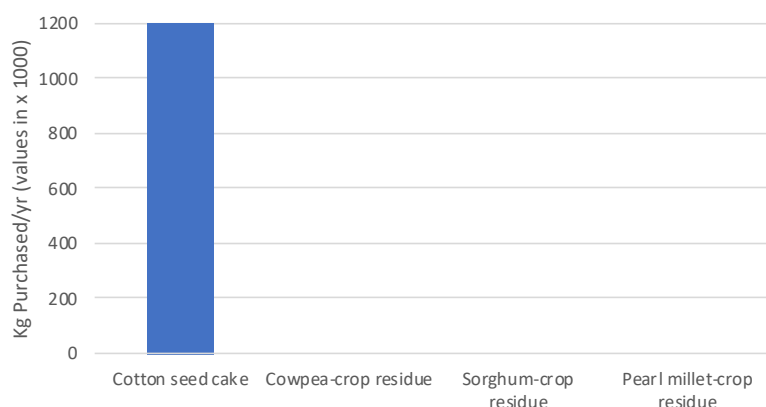
Feed purchased

The interview showed the types, quantities and prices of purchased feed to augment available feed resources particularly in the dry season and throughout the year for households who engaged in fattening (Figure 11). The survey showed the feed type frequently purchased by all the farmers (both male and female) in Falagountou was whole cotton seed cake. Results obtained from men indicated other feed types such as cowpea and sorghum residue were also purchased, while residues of pearl millet and maize were the least purchased feed types.

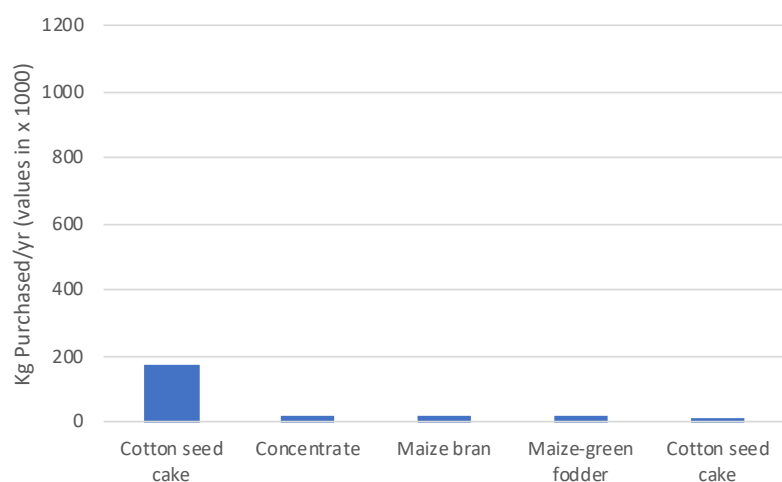
Farmers through their indigenous knowledge noted that cotton seed cake contained higher nutrient concentrations than other feed resources, justifying its purchase. Similarly, the survey results from Samorangouan showed that the feed type frequently purchased by the farmers (both male and female) was whole cotton seed cake (Figure 11). According to the male focus group, maize, green fodder and whole grain were the next most frequently purchased feeds next to whole cotton seed cake. However, women reported that concentrate feed and maize gluten with bran were next to cotton whole seed cake.

Figure 11: Dominant feed by types and kg purchased (up to 5) according to farmers in (a) Falagountou and (b) Samorangouan

(a)



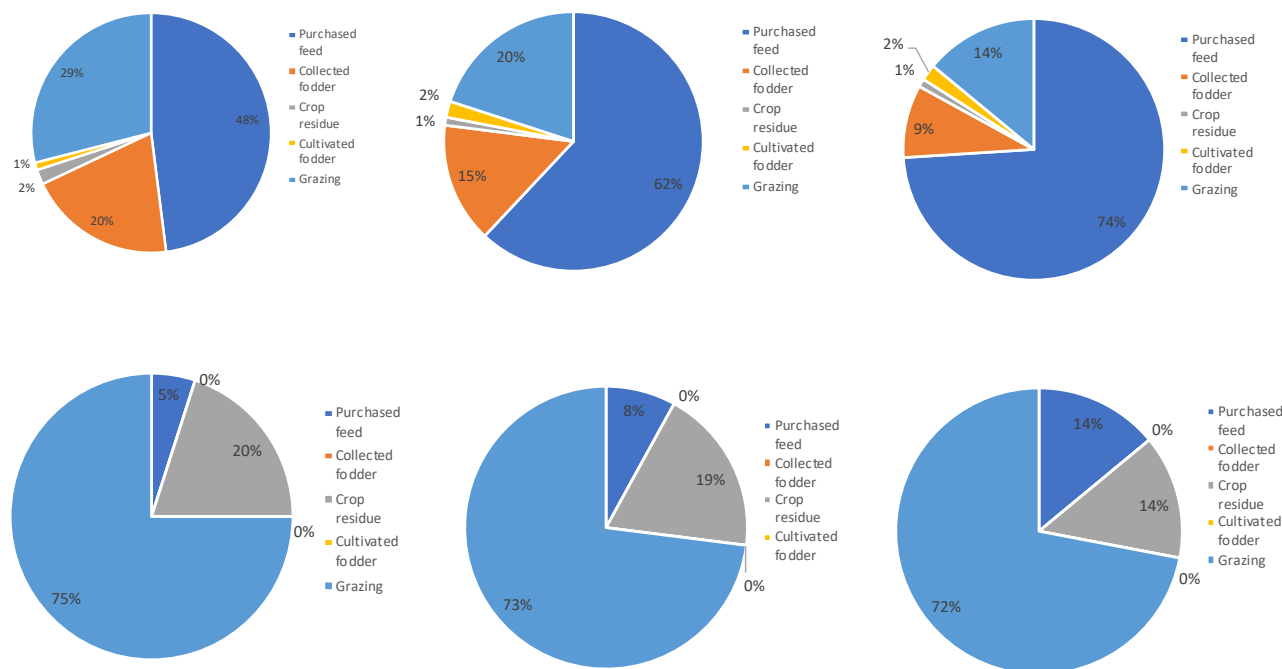
(b)



Contribution of various feedstuff to the dry matter (DM), metabolizable energy (ME) and crude protein (CP) contents of total diet

The contributions of feed resources to total livestock diet based on their quality are presented in figure 12 below. In Falagountou, purchased feeds contributed most in terms of DM, ME and CP. The contribution from crop residues to the DM, ME and CP content of the diet was lower than 3% indicating the low quantity and nutrient value of the available crop residues in Falagountou. The results of the contributions of feed resources to total livestock diet based on their quality showed that grazing contributed most (>70%) to DM, ME and CP of the total diets in Samorangouan. It contributes between 58–79% to each of the livestock feedstuff contents. The results also showed that crop residues contributed next to grazing as its contribution to DM, ME and CP was 20%, 19% and 14%, respectively.

Figure 12: Contribution of various feedstuffs to the DM, ME and CP contents of total diet according to farmers in (a) Falagountou and (b) Samorangouan

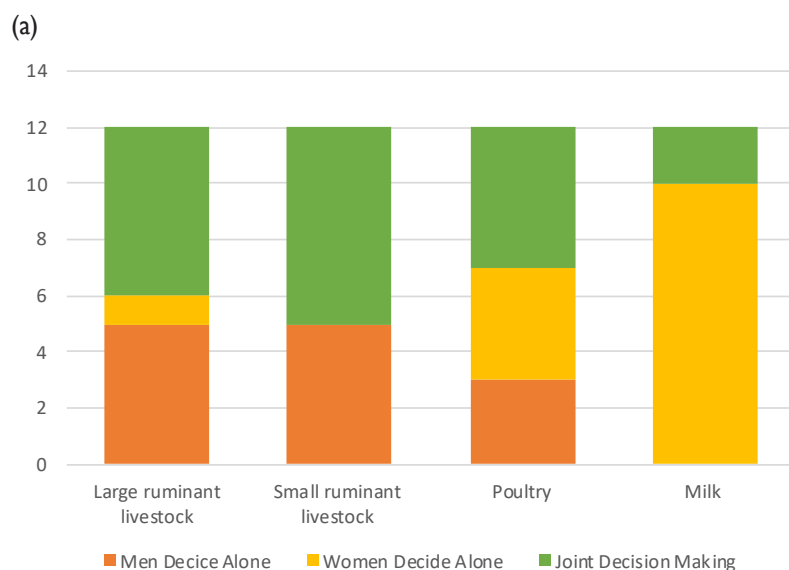


Gendered decision-making on sale of livestock and milk

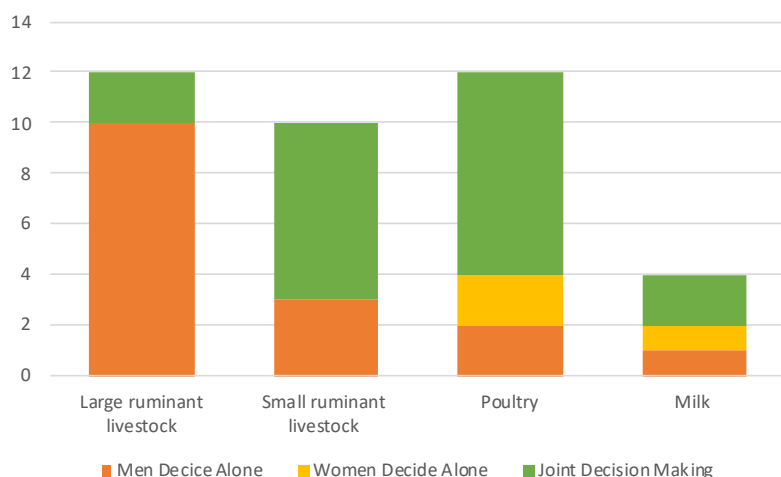
Decisions on livestock, including but not limited to what livestock to raise and when to buy or sell livestock, are either made alone by men and women or jointly made. In Falagountou, results showed that decisions on large ruminants, small ruminants (sheep and goats) and poultry are decided jointly or by men. (Figure 13). Decisions on sale of milk are mostly taken by women.

The results in Samorangouan indicated that decisions on large ruminants are mainly made by men while decisions on small ruminants and poultry are mostly made jointly (Figure 13).

Figure 13: Gendered decision-making on livestock by farmers in (a) Falagountou and (b) Samorangouan



(b)

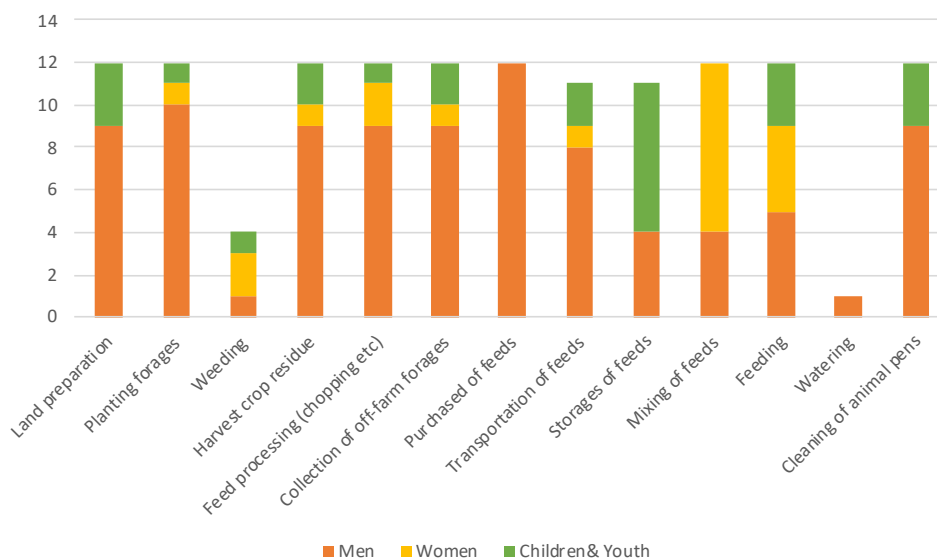


Gender division of labour in feed production, harvesting and feeding

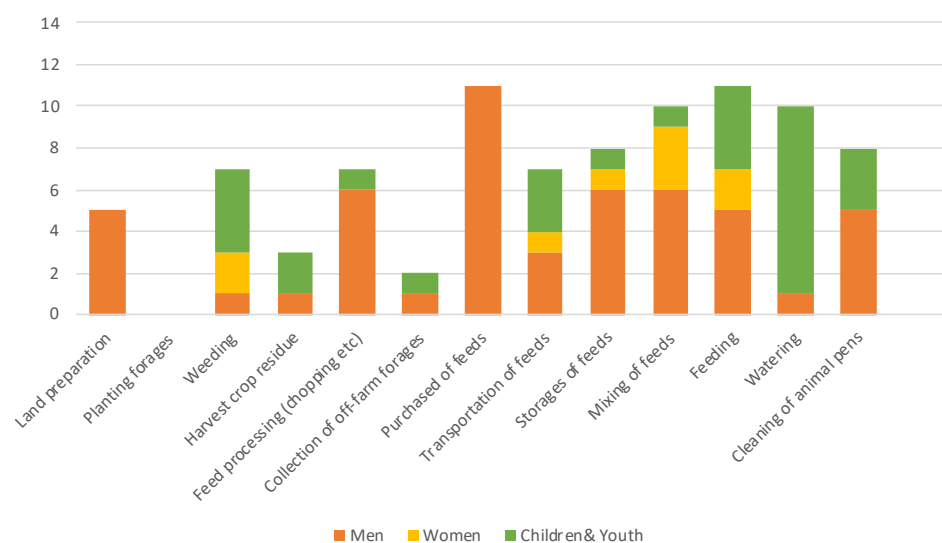
The results from Falagountou showed that every member of the household contributes to livestock production with regards to feed (Figure 14). Sole responsibility of the men is the purchase of livestock feeds while they also contribute to other required labour. According to the results, storage of feeds and forages, and mixing of feed were mostly children and women's responsibilities, respectively. The results from Samoranguan showed that most activities are carried out by men except watering, harvesting of crop residues and weeding (Figure 14). Land preparation and purchase of feeds are the sole responsibility of men while weeding, watering of animals and mixing of feeds are done mostly by children and youth.

Figure 14: Gender division of labour in feed production, harvesting and feeding by farmers in (a) Falagountou and (b) Samoranguan

(a)



(b)



Problems, issues and opportunities

In this study the major problems observed and identified by both groups of male and female farmers are similar except in their order of importance. In Falagountou, the major problems mentioned by male farmers regarding livestock production were shortage of feed, scarcity of water, problem of disease and irregular veterinary service. Problems mentioned by female farmers were scarcity of water first and then shortage of feed as mentioned in Table 1. These results underscore the importance of collecting gender disaggregated data showing different priorities for livestock management interventions. From the response of farmers in Samonrangouan, feed shortage was the top ranked livestock problem by the male farmers followed by water scarcity (Table 2). Similar to the response of female farmers in Falagountou, water scarcity was ranked as the major livestock problem, followed by feed scarcity, contrary to the ranking by male farmers in Samonrangouan.

Several solutions suggested by the farmers are listed in Table 2 and 3 along with the stated problems. All farmers in Falagountou requested for technical training on livestock production to build on their indigenous knowledge. It should be noted that female farmers rated the need for training higher than male farmers.

Problems in order of importance	Problems identified by male farmer	Proposed solution by male farmers	Problems identified by female farmers	Proposed solution by female farmers
1	Shortage of feed in quantity and quality	Introduction of good pasture crop	Shortage of water	Creation of more boreholes
2	Shortage of water	Construction of bore-holes with storage facilities in the village	Shortage of feed in quantity and quality	Creation of communal grazing land
3	Disease and irregular veterinary services	Subsidizing the price of veterinary drugs by the government or low-cost drug centres in the village	Disease and irregular veterinary services	Establishment of veterinary service within the communities
4	Poor access to credit	Increase access to credit service	Inadequate technical knowledge of livestock production	Training
5	Inadequate technical knowledge of livestock production	More technical knowledge in feeds production, processing and feeding	Poor access to credit	Creation of women cooperatives

Table 3 Gender disaggregated pairwise matrix ranking result of the problems of livestock production in Samorangouan				
Problems in order of importance	Problems identified by male farmers	Proposed solution by male farmers	Problems identified by female farmers	Proposed solution by female farmers
1	Shortage of feed in quantity and quality	Creation of more grazing areas	Shortage of water	Creation of dam and more wells
2	Shortage of water	Creation of more water points	Shortage of feed in quantity and quality	Encourage forage cultivation
3	Shortage of land	Release of more government acquired land for farmers	Financial insecurity	Establishment of veterinary services within the communities
4	Disease and irregular veterinary services	Increase the number of veterinarians and provision of more drugs	Farmers - herders' clashes	Training
5	Farmers - herders' clashes	The solution mentioned above will eliminate the clashes	Disease and irregular veterinary services	Reinforce health services, regular general flock treatment and vaccination

Source: Focus group discussions with farmers

Discussion

Farming systems in our study sites are characterized as extensive, low external input and mixed crop-livestock systems of a subsistence nature. A diversity of farming types exists within the specific system with relative importance of livestock being largely determined by rainfall, following a north-south gradient (Callo-Concha et al. 2013). The humid regions in the south are dominated by cereals (maize, sorghum and millet), legumes (groundnut and cowpea) and cotton as principal cash crops. Moving northwards where rainfall decreases to 600 mm/year at the limit of the Sudan savanna, sorghum, millet, groundnut and cowpea are the main crops. Omae et al. (2014) reported that crops grown are used as a means of income generation whereas residues from cereal and leguminous crops are either used to feed livestock or sold as livestock feed.

Percentage migration of the of rural population in Falagountou was higher than in Samorangouan but with more youth migrating from Samorangouan than in Falagountou. Barry et al. (2005) reported similar migration from the Southern Burkina Faso to Cote d'Ivoire and to a lesser extent to Ghana especially by the young age group. The departure of these members of the working population depopulates the villages and deprives them of the workforce required to implement both crop and livestock labour intensive initiatives. Male outmigration creates demographic imbalances in key age-groups, which results in increasing demand for women's agricultural labor (Boyer and Deubel 2016).

Our results on household sources of income is similar to that of a study conducted in Burkina Faso, where household income sources across the Sudano-Sahelian regions were dominated by rainfed crop production and livestock (Nielsen and Zorom 2010). In general, the combination of all income from livestock and livestock products forms a major contribution to household income in Falagountou. Besides the income from cash crops and livestock, off-farm activities, mainly handicrafts and remittances, are pursued both to generate regular cash income and to reduce the risk of a failed rainy season. The diversification of income into non-crop production has been identified as a critical livelihood strategy for rural households, particularly in Africa (Barrett et al. 2001).

Livestock are thought to be one of the most important assets for women as they are productive and can easily be owned by women as they are not bound by complex property rights compared to, for example, land. In the case of Falagountou, although women are involved in the production of livestock up until marketing, the income from livestock does not fall directly under the control of women. Our results indicated that livestock in Falagountou are entirely owned by men and are a mainstay of household income. The access and control of income from livestock is entirely in the male domain. While women's participation in livestock production, management and marketing may be viewed as an important way to improve the welfare of women and their families, it is also important that women are able to make decisions about which products and animals are sold and what is done with the proceeds of the sale. Otherwise, participation alone may not benefit women (Kristjanson et al. 2010). According to a report written by Ayantunde et al. (2017) found that while women actively participate in most activities along the fodder value chain, proceeds from the biomass produced were unequally distributed. Options for increasing probability of women owning livestock and access to income from livestock is essential. In Samorangouan located within the South Sudanian zone, women derived more income from livestock when compared with overall household income. Benefits of women's managed income has been reported as providing a fallback position in the event of a divorce and strengthening their ability to deal with threats and domestic violence (Sen 1985). Most importantly, women's management of income has been associated with improved child nutritional status (Njuki and

Sanginga 2013) which underscores one of the roles of livestock production in rural areas. It therefore follows that when women lose control of income particularly from livestock, one or all of these benefits may be missing directly or indirectly.

As noted in the results, women from both sites recognized water scarcity as the main constraint to livestock productivity. UNFPA (2002) estimated that women in many developing countries walk an average of six kilometers a day to collect water. This poses a major limitation since women are responsible for providing water for the household and livestock. The availability of clean water closer to home saves time, which can be spent on other productive and human development activities such as crop production (IFAD 2007). The World Bank, IFAD and FAO (2009) suggested that water projects should be designed to address women's and men's domestic and productive water needs.

From both study sites, the most limiting factor of the formal credit facility is the demand for high collateral and a guarantor. As a result, male farmers appear to have more access to credit facilities than female farmers. Women make essential contributions to agriculture and rural economies in all developing countries. Two key constraints to their productivity are lack of access to productive resources such as land, water, capital and labour, and lack of freedom to play a fully participatory role in decision-making about these resources (Ayantunde et al. 2017). The same authors concluded that when women lack access to these productive resources or are unable to fully participate in decisions about them, they are often unable to make investments that would help boost overall levels of household production. A report by the Food and Agriculture Organization (FAO 2011) argues that if women were to have access to the same level of resources as men, agricultural productivity would go up by 10–30% and agricultural output would increase by up to 4%.

Potential interventions derived from solutions suggested by farmers and existing opportunities

Based on the problems existing in the area, taking potential interventions as required is crucial for revitalizing the livestock production and productivity of the study area. However, we noted that potential interventions must be tailored to specific opportunities and constraints of male and female farmers.

1. Farmers reported that lack of information on various feed resources was the predisposing factor for not exploiting the potential of the livestock sector to the fullest. Hence, training on available feed sources would be instrumental to enhance knowledge base and attitude/behaviour change of the farmers and livestock extension workers. Access to new technology, information and training related to livestock production should be gendered as most initiatives are currently targeted at men.
2. It is important to improve the quantity and utilization of crop residues. Farmers depend largely on crop residues generated from their farms which are not enough to feed all of the animals they keep. Dual purpose varieties of pearl millet and sorghum could be introduced to the farmers to increase the quantity of crop residues without limiting the grain yield. In addition, poor storage facilities and strategies limit the utilization of feed resources. Training on improved conservation to retain the quality of crop residues and crop residue treatment to improve intake and quality will be one of the proposed interventions for livestock production in both villages.
3. General health management and disease prevention are the most important factors that affect ruminant production in tropical environments. Losses because of ill health and diseases have not been quantified in economic terms. Therefore, intervention must include proper animal healthcare. Provision of a veterinary centres around these two villages is essential.
4. Better management of existing water resources should be promoted through rainwater collection for dry periods, usage of existing limited water sources by making water reservoirs or ponds and extraction of ground water with the assistance of government and nongovernment organizations.
5. Farmer–herder conflicts are increasing as access paths to local (transhumance) pastures are obstructed and traditional grazing areas are converted to crop land. There is a need for conflict resolution efforts to mediate between the two groups. Interventions should target both crop improvement and livestock feeds in a complementary approach.
6. Integrated crop farming with shade tolerant forage grass and legumes planted in tree plantations, particularly in Samorangouan, could encourage the effective utilization of same land resources where the tree biomass helps to enrich the soil and the animal dung as well. Planting of fodder shrubs and trees as edge rows in arable crop lands in form of alley cropping will also restore nitrogen to the top layer of soil so that farmers can use the same piece of land year after year to grow their forage crops.
7. Development of herbaceous forage legumes and fodder tree species which can mitigate the constraints of feed scarcity can provide an important source of feed and have considerable potential for increased use, especially to

maintain green leaf into the dry season and use as supplementation for low-quality crop residue. Introduction and strengthening of agro-silvo-pastoral systems particularly in Samonrangouan where the rainfall is > 800 mm could provide stability and productivity of livestock production, which is the major source of livelihood and income in arid and semi-arid African zones.

Conclusion

We could conclude from this study that feed resources for livestock production are diverse and vary markedly across agroecological zones in West African Sahel and across seasons in terms of type, availability, quantity and quality. Feed resources were mainly crop residues harvested from the farmers' fields, or purchased feed and natural pasture. Cotton seed cake and cowpea were the major purchased feeds. Livestock are mostly owned by men, but their management, particularly the feeding and watering are mostly done by women. This should be considered when promoting interventions. In addition, the results showed that livestock contribute to rural income in both Falagountou and Samorangouan. Increase in productivity or profitability of livestock are likely to be a direct pathway out of poverty for most households. Since the major livestock limitation is lack of quality feed (according to men) and water (according to women), target interventions should include a combination of feed and water solutions.

Reference

- Amole, T. and Ayantunde, A. 2016. Improving livestock productivity: Assessment of feed resources and livestock management practices in Sudan-Savanna zones of West Africa. *African Journal of Agricultural Research* 11(5):422–440.
- Ayantunde, A., Yameogo, V., Traore, R., Kansaye, O., Kpoda, C. et al. 2017. *Improving livestock fodder production through greater inclusion of women and youth*. Colombo, Sri Lanka: CGIAR Research Program on Water, Land and Ecosystems. <https://hdl.handle.net/10568/79942>
- Barrett, C.B., Reardon, T. and Webb, P. 2001. Nonfarm income diversification and household livelihood strategies in rural Africa: Concepts, dynamics, and policy implications. *Food Policy* 26 (4): 315–331.
- Barry, B., Obuobie, E., Andreini, M., Andah, W. and Pluquet, M. 2005. *The Volta River Basin: Comparative study of river basin development and management*. Colombo, Sri Lanka: International Water Management Institute (IWMI)
- Beal, T., Belden, C., Hijmans, R., Mandel, A., Norton, M. and Riggio, J. 2015. Country profiles: Burkina Faso. Sustainable Intensification Innovation Lab. (Available from <https://gfc.ucdavis.edu/profiles/rst/bfa.html>) (Accessed 24 October 2019)
- Boyer, M. and Deubel, T. 2016. *Gender, Markets and Women's Empowerment in the Sahel Region: A Comparative Analysis of Mali, Niger, and Chad*. World Food Programme.
- Callo-Concha, D., Gaiser, T., Webber, H., Tischbein, B., Müller, M. and Ewert, F. 2013. Farming in the West African Sudan Savanna: Insights in the context of climate change. *African journal of agricultural research* 8: 4693–4705. Doi:10.5897/AJAR2013.7153.
- Duncan, A., York, L., Lukuyu, B., Samaddar, A. and Stür, W. 2012. *Feed Assessment Tool (FEAST): A systematic method for assessing local feed resource availability and use with a view to design intervention strategies aimed at optimizing feed utilization*. Questionnaire for Facilitators. Version 5.3, updated 15 June 2012. Addis Ababa, Ethiopia: ILRI. (Available from <http://www.ilri.org/feast>)
- Douxchamps, S., Ayantunde, A., Panyan, E.K., Ouattara, K., Kaboré, A. et al. 2015. Agricultural water management and livelihoods in the crop-livestock systems of the Volta Basin. *Water Resources and Rural Development* 6: 92–104.
- FAO. 2011. *The State of Food and Agriculture 2010–2011. Women in Agriculture: Closing the Gender Gap for Development*. Rome, Italy: FAO
- Fernández-Rivera, S., Hiernaux, P., Williams, T.O., Turner, M.D., Schlecht, E. et al. 2005. Nutritional constraints to grazing ruminants in the millet-cowpea-livestock farming system of the Sahel. In: Ayantunde, A.A., Fernández-Rivera, S., McCrabb, G. (eds) *Coping with Feed Scarcity in Smallholder Livestock Systems in Developing Countries*. Nairobi, Kenya: International Livestock Research Institute (ILRI) pp. 157–182. <https://hdl.handle.net/10568/50886>
- Guinko, S. 1984. *Végétation de la Haute-Volta*. Thèse de doctorat d'Etat ès Sciences Naturelles, Bordeaux III, 2 vol, 394p.
- IFAD (International Fund for Agricultural Development). 2007. *Gender and Water Securing Water for Improved Rural Livelihoods: The Multiple-Uses System Approach*. Rome, Italy: IFAD.
- Njuki, J. and Sanginga, P.C. 2013. *Women, livestock ownership and markets: Bridging the gender gap in eastern and southern Africa*. London, UK: Routledge. <https://hdl.handle.net/10568/34088>
- Kristjanson, P., Waters-Bayer, A., Johnson, N., Tipilda, A., Njuki, J. et al. 2010. *Livestock and Women's Livelihoods: A Review of the Recent Evidence*. ILRI Discussion Paper 20. Nairobi, Kenya, ILRI. <https://hdl.handle.net/10568/3017>
- Lukuyu, B., Eerdewijk, A. Van, Kinati, W., Sultana, N., Mulema, A. and Duncan, A. 2019. *Gendered Feed Assessment Tool (G-FEAST) individual farmer interview questionnaire*. Nairobi, Kenya: ILRI. <https://hdl.handle.net/10568/100244>

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- Nielsen, J. and Zorom, M. 2010. Climate Factors Play a Limited Role for Past Adaptation Strategies in West Africa. *Ecology and Society* 15: 4.
- Omae, H., Addam, K.S. and Satoshi, T. 2014. Improving Millet-Cowpea Productivity and Soil Fertility with Crop Rotation, Row Arrangement and Cowpea Density in the Sahel, West Africa. *American-Eurasian J. Journal of Agriculture and Environmental Sciences* 14 (2): 110–115
- Powell, J.M., Pearson, R.A. and Hiernaux, P.H. 2004. Crop-livestock interactions in the west African drylands. *Agronomy Journal* 96:469–483.
- Sen, A. 1985. Well-being, agency and freedom: the Dewey lectures 1984. *Journal of Philosophy* 82: 169–221.
- The World Bank, FAO and IFAD. 2009. Gender in agriculture sourcebook. ISBN 978-0-8213-7587-7 — ISBN 978-0-8213-7588-4 (electronic).
- Umutoni, C., Ayantunde, A. and Sawadogo, G.J. 2015. Evaluation of feed resources in mixed crop-livestock systems in Sudano-Sahelian zone of Mali in West Africa. *International Journal of Livestock Research*. Doi: 10.5455/ijlr.20150813090546.
- UNFPA (United Nations Population Fund). 2002. *Water: A Critical Resource*. New York, USA: UNFPA.

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